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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/657,142	09/09/2003	Tatsuhiko Monji	056208.52762US	4042

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EXAMINER

ALLISON, ANDRAE S

ART UNIT	PAPER NUMBER
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2624

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	12/28/2006	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/657,142

Applicant(s)

MONJI, TATSUHIKO

Examiner

Andrae S. Allison

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 2/9/2006;9/9/2003.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Specification Objection

1. The disclosure is objected to because of the following informalities:

The phrase "oncoming-ca" on page 8, line 24 should read "oncoming-car" because the word "car" is misspelled.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 2 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 2 recites the limitation "the infrared light" on page 31, line 13. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claim 14 is rejected under 35 U.S.C. 102(b) as being anticipated by Kojima (Translation, JP02000019259).

As to claim 14, Kojima discloses an on board image recognition apparatus (4, see Drawing 1 of Kojima) comprising an image pick-up lens (see Drawing 12) and a image pick-up device (2, camera head, see Drawing 1), wherein there is disposed between the image pick-up lens and the image pick-up device a filter (12 A and 12B, see Drawing 5) having an area that transmits visible light and an area that intercepts the visible light ([p][0015], lines 1-5).

Claim Rejections - 35 USC § 103

5. Claims 1-11, 13, 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kojima (Translation, JP02000019259) in view of Shigeo (Translation, JP 2001189926).

As to claim 1, Kojima discloses an on board image processing apparatus (4, see Drawing 1) for recognizing surrounding objects of a vehicle ([p][0002], lines 1-2), based

on image signals obtained by picking-up the circumference of the vehicle with an image pick-up device (2, camera head, see Drawing 1) the image pick-up device being equipped with a first pixel row zones which have sensitivity to visible light and a second pixel row zones which have sensitivity to invisible light alternatively (note that the camera head is equipped with infrared and visible light cameras, see [p][0011], lines 2-3), wherein the apparatus further comprises an image signal processing section (see Fig 7) for recognizing the objects using visible light zone image signals obtained from the first pixel row zones and image signals obtained from the second pixel row zones (see [p][0020]-[0022], where images captured from the infrared and visible cameras are processed for recognizing a pedestrian).

However, Kojima does not disclose expressly the image pick-up device being equipped with a first pixel row zones which have sensitivity to visible light and a second pixel row zones which have sensitivity to invisible light. Shigeo discloses an image pickup device for detecting obstruction ([p][0001], lines 1-3), the image pickup device equipped with a first pixel row zones which have sensitivity to visible light and a second pixel row zones which have sensitivity to invisible light alternatively (see Drawing 2).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to substituted the camera head of Kojima with the image pickup device of Shigeo for capturing infrared and visible images alternatively, and also to create a more compact on board processing apparatus.

As to claim 16, note the discussion above, Kojima and Shigeo teach an on board image recognition apparatus (4, see Drawing 1 of Kojima) comprising an image pick-up lens (see Drawing 12 of Kojima) and a image pick-up device (2, camera head, see Drawing 1 of Kojima), wherein the image pick-up device the is constituted by a photo sensitive element (3, photo detector, see Drawing 2 of Shigeo) having sensitivity to visible light ([p][0021], lines 1-2 of Shigeo) and a photosensitive element (2, photo detector, see Drawing 2 of Shigeo) having sensitivity to invisible light ([p][0021], line 2 of Shigeo).

As to claim 2, Kojima teaches the on board image recognition apparatus as defined in claim 1, wherein the infrared light is used as the invisible light ([p][0014], line 3).

As to claim 3, neither Kojima or Shigeo teach the on board image recognition apparatus wherein ultraviolet light is used as the invisible light. However, ultraviolet light is a well known form of invisible light that make up the light spectrum, therefore it would have been obvious to have substituted ultra violet light for the infrared light.

As to claim 4, note the discussion above, Shigeo teaches the on board image recognition apparatus, wherein each of the first pixel row zones of the image pick-up device that are sensitive to visible light are constituted by each of the first light sensitive elements (photo detector 3, see Drawing 2) sensitive to visible light ([p][0021], line 1),

and each of the second pixel row zones of the image pick-up device that are sensitive to the invisible light are constituted by second light sensitive elements (photo detector 2, see Drawing 2) sensitive to invisible light ([p][0021], line 2).

As to claim 5, note the discussion above, Shigeo teaches the on board image recognition apparatus wherein the image pick-up device has a first filter (18, light filter, see Drawing 5) that transmits visible light ([p][0024], lines 6-7) disposed in front of the first light sensitive elements to constitute first pixel row zones, and a second filter (19, infrared filter, see Drawing 5) that transmits invisible light ([p][0024], lines 7-8) disposed in front of the second element to constitute the second pixel row zones.

As to claim 6, note the discussion above, Shigeo teaches the on board image recognition apparatus wherein each of the first pixel row zones sensitive to visible light and each of the second pixel row zones sensitive to invisible light are constituted by pixel rows arranged in the horizontal direction ([p][0021], lines 1-3), both of the pixel row zones being arranged in perpendicular direction alternatively (see Drawing 2)..

As to claim 7, neither Kojima or Shigeo teach the on board image recognition apparatus wherein the density of the first pixel row zones sensitive the visible light is higher than that of the second pixel row zones sensitive to the invisible light in the image pick-up device. Applicant has not disclosed that having the density of the first pixel row zones sensitive the visible light higher than that of the second pixel row zones

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sensitive to the invisible light in the image pickup device provides an advantage, is used for a particular purpose or solves a stated problem. Therefore it would have been obvious to have the density of the first pixel row zones sensitive the visible light higher than that of the second pixel row zones sensitive to the invisible light in the image pickup device

As to claim 8, note the discussion above, Shigeo teaches the on board image recognition apparatus wherein each of the first pixel row zones sensitive to the visible light and each of the second pixel row zones sensitive to the invisible light are constituted by pixel rows arranged in the perpendicular direction ([p][0022], lines 1-3), both of the pixel row zones being arranged in the horizontal direction alternatively (see Drawing 3).

As to claim 9, Kojima teaches the on board image recognition apparatus, wherein the image signal processing section recognizes a high reflection object and a low reflection object based on information of difference value (difference image, [p][0066], lines 1-3) between the first pixel row zones and the second pixel row zones that adjoin each other in the horizontal direction or the perpendicular direction.

As to claim 10, Kojima teaches the on board image recognition apparatus wherein the image signal processing section recognizes, based on the recognition

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results of the high reflection object and the low reflection object an oncoming car ([p][0070], lines 1-3).

As to claim 11, neither Kojima or Shigeo teach the on board image recognition apparatus, wherein the image signal processing section performs controlling of turn-on of invisible light floodlight, based on the visible light image signals. However, it would have been obvious to have turn on an invisible light source so that reflected invisible light from an object can be captured by invisible light sensors, thereby creating invisible light images.

As to claim 13, Kojima teaches the on board image recognition apparatus wherein the image signal processing section uses selectively, based on the state of turn-on of the invisible light floodlight, the visible light image signals and the invisible image signals to create image signals for displaying on a monitor screen ([p][0018], lines 1-10).

As to claim 15, note the discussion above, Shigeo teaches the on board image recognition apparatus wherein the image pick-up device is a CCD for monochrome ([p][0002], line 6).

6. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kojima (Translation, JP02000019259) in view of Shigeo (Translation, JP 2001189926) further in view of Yasui et al (US Patent No.: 6,163,022).

As to claim 12, note the discussion above, neither Kojima or Shigeo disclose the on board image recognition apparatus, wherein the image signal processing section detects a run lane based on the detected object.

Yasui discloses an image apparatus wherein the image signal processing section detects a run lane (31, lane detection, see Fig 8) based on the detected object (column 11, lines 50-60). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to added the image apparatus of Yasui to the environmental recognition device of Kojima as modified by Shigeo to capture infrared and visible images for detecting a lane along which a car is traveling, thus detecting if a run lane or lane departure has occurred.

Conclusion

The prior art made part of the record and not relied upon is considered pertinent to applicant's disclosure.

Keneko et al (US Patent No.: 4,608,599) is cited to teach an infrared image pickup device that creates infrared and visible images.

Fujimura et al (US Patent No.: 7,139,411) is cited to teach a pedestrian detection and tracking system that uses night vision.

Camus et al (Pub No.: 2004/0252862) is cited to teach a vision system that identifies and classifies objects.

Hanawa (Pub No.: 2003/0099377) is cited to teach a vehicle surrounding monitoring apparatus.

Inquiries

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrae S. Allison whose telephone number is (571) 270-1052. The examiner can normally be reached on Monday-Friday, 8:00 am - 5:00 pm, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Mancuso can be reached on (571) 272-7695. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Andrae Allison

December 14, 2006

A.A.


JOSEPH MANCUSO
SUPERVISORY PATENT EXAMINER